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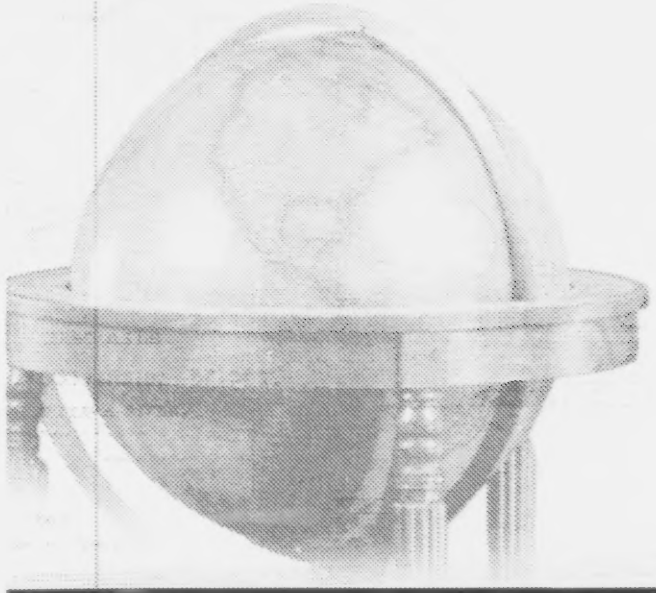
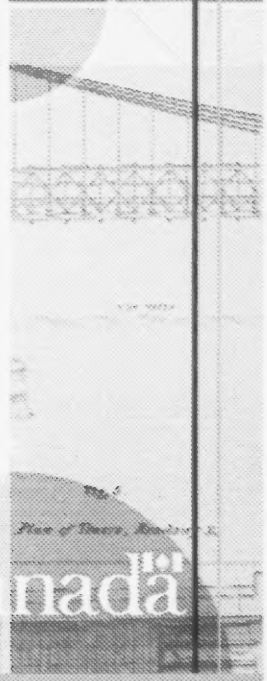
Managing Cartographic, Architectural and Engineering Records in the Government of Canada





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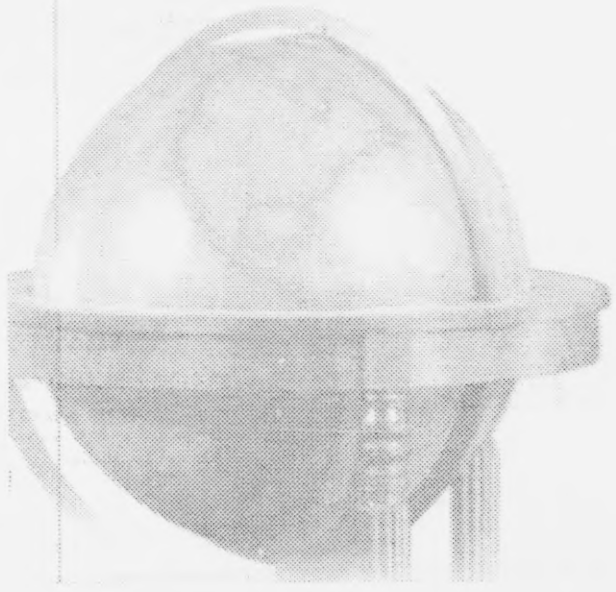

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Preface

The National Archives of Canada acquires, preserves and makes available records of national significance. The Archives also provides a comprehensive program to help federal government institutions and ministers' offices manage their records.

The program includes advice on standards and practices for the management and protection of government information, and direction and assistance in planning the disposition of institutional records.

To ensure that there is a consistent approach to information management within the government, the National Archives investigates the impact of emerging technologies, develops standards and practices, and produces technical handbooks.

Managing Cartographic, Architectural and Engineering Records in the Government of Canada is one of a series of handbooks on records and information management. It was written by Louis Cardinal, in cooperation with the Office of Government Records and in consultation with cartographic and architectural archivists, information management analysts, custodians and conservators at the National Archives of Canada. Any comments or questions about this handbook or about other information management issues are welcome. Please address your remarks to:

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395 Wellington Street
Ottawa, Ontario K1A 0N3
Tel.: (613) 947-1518
Fax: (613) 947-1500

Also available:

Guidelines for Managing Recorded Information in a Minister's Office

Managing Photographic Records in the Government of Canada

Managing Audio-Visual Records in the Government of Canada

Managing Documentary Art Records in the Government of Canada

Managing Your Computer Directories and Files

Vi

Introduction

In the government of Canada, cartographic, architectural and engineering records have been and continue to be created and/or used as part of daily operations, providing information that supports activities, programs and policies. Cartographic records, or maps, were/are created and used to gain knowledge of Canada, its vast spaces and wealth of resources. Maps were useful tools for developing the land, as well as for administering and safeguarding the nation. Architectural and engineering records were/are created and used as the government, fulfilling its role as landowner, developer, administrator and employer, built or contracted the construction of a wide range of structures, including housing on Indian reserves and military bases, grain elevators, airports, canals, ships, aircraft, post offices, customs bureaus, etc.

To date, most departmental records offices have not included cartographic, architectural and engineering records in their corporate inventory of information holdings nor in their record systems. Government institutions, however, are becoming increasingly aware that they need to manage all their information, regardless of media, including cartographic, architectural and engineering records. Because identifying and managing these types of records is not an easy task, the National Archives of Canada has developed this guide, *Managing Cartographic, Architectural and Engineering Records in the Government of Canada.*

Written for federal employees who create, collect, use or maintain cartographic, architectural and engineering records, the guide contains advice on how to manage these records, including:

I. **How to identify** cartographic, architectural and engineering records in a government institution.

II. **How to organize** them so that they are easy to retrieve and use.

III. **How to protect** them against damage and loss.

IV. **How to plan their retention and disposition.**

1

Cartographic, Architectural and Engineering Records

The federal government produces an enormous number of cartographic, architectural and engineering records. Before we can manage these records properly, we must first understand exactly what they are. How can we recognize the different types of cartographic, architectural and engineering records? What is the difference between a cartographic record, an architectural record and an engineering record? What are their formats? How are they used?

Although each type of record has distinctive features, cartographic, architectural and engineering records are often treated in similar fashion because their formats are similar and they share the common feature of being made to scale. The following explanations will help you to recognize and identify these records in your institution.

Definitions

Cartographic Records

A cartographic record is any document that represents, in graphic or photogrammetric form, "... the whole or part of the Earth or any celestial body, normally to scale. Included are two- and three-dimensional maps and plans; topographic maps and hydrographic charts, aeronautical, navigational and celestial charts; globes; block diagrams; sections; remote sensing images (e.g., aerial photographs with a cartographic purpose); atlases and map views."[1] Cartographic records also include other thematic map series, cartograms and scale models.

The Europeans had produced a very large number of land maps and sea charts which they needed to navigate the waters around Canada and to conquer, colonize and develop the land. In 1867, the Government of Canada inherited the British cartographic tradition and used it to develop its own maps and charts. Because maps make it possible to know a territory and develop it, they were at the time – and remain to this day – essential for any country, particularly one as vast as Canada.

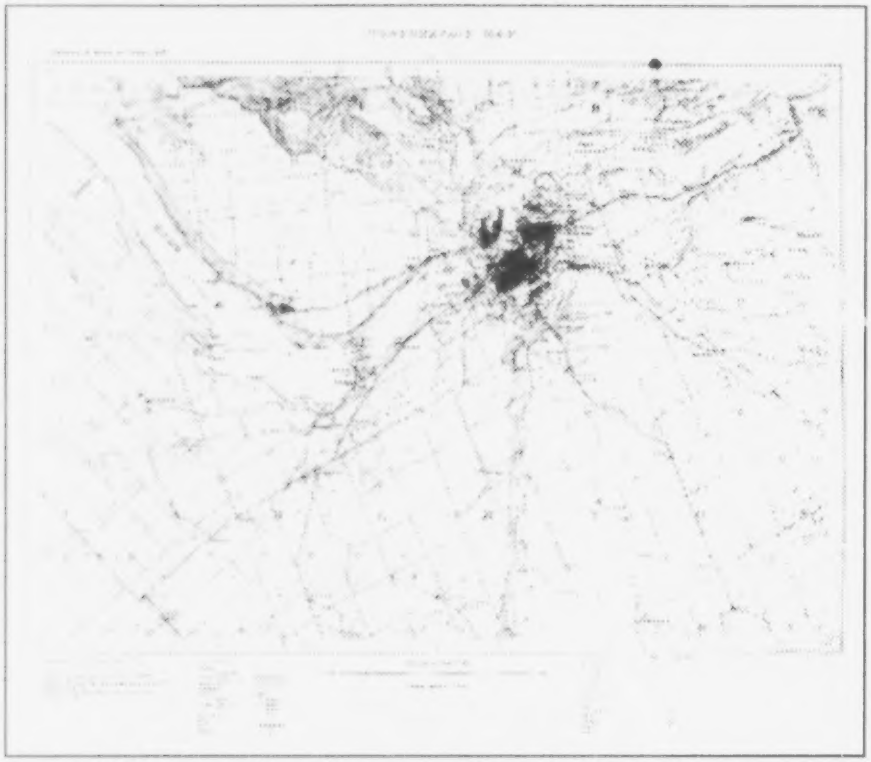
Thanks to maps and the information they contain, we are able to take greater advantage of the country's resources and gain a better understanding of Canada's position among the natural and human phenomena that shape the Earth.

Essentially, cartographic records and the large quantities of preparatory records required to produce them are used to improve our knowledge of Canada's land, waters and air space, the richness of its soil, subsoil and sea bottom, to secure the country's defence and to promote public sport and recreational activities. Some cartographic records are also used to enhance Canada's reputation abroad.

The majority of cartographic records found in government departments fall into two categories: published maps and unpublished maps.

- Most **published maps** are series maps, comprising numerous sheets. These maps are intended for public distribution. Among these, the topographic map is the basis for the other maps. Planimetric and geological maps, as well as hydrographic charts, were produced starting in the second half of the

1 *Rules for Archival De...ription*, Chapter 5, Rule 5.0A1, Bureau of Canadian Archivists, Canadian Council of Archives, 1995-2000

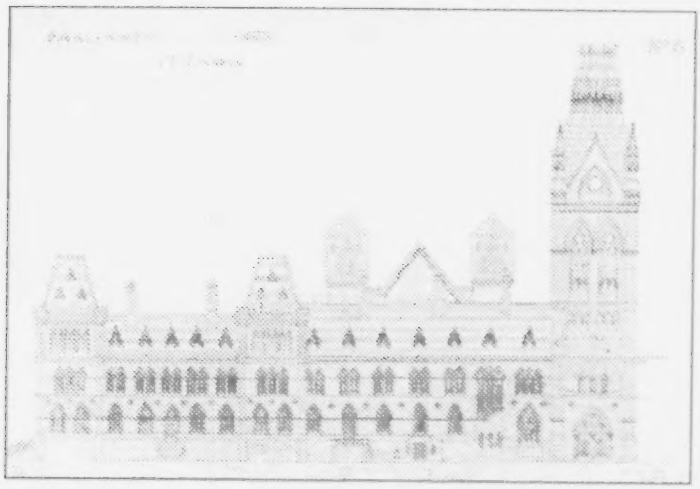


Example of a cartographic record: ***Topographic Map, Ontario-Quebec, Ottawa Sheet.*** *Scale 1:63 360 [Ottawa]: Department of Militia and Defence, 1906. NMC 18372*

nineteenth century and are still produced today. Many other thematic series have since been added; they include aeronautical charts, maps of electoral district boundaries, soil maps, land use and land inventory maps, boundary maps, military maps, *The National Atlas of Canada*, maps of glaciers, maps of forests, maps of postal routes, flood-risk maps, maps of foreign countries produced by Canada, etc. Each of the sheets of a series can be updated; this is most often the case for those depicting the most densely populated regions in Canada. Generally, there are sheet map indexes for these series.

The government also produces general maps of the country and its regions, as well as specialized maps such as tourist maps, maps of national parks and Indian reserves, etc. Maps were also produced to document Canada's participation in the two World Wars (e.g., maps depicting front lines and trench maps).

- **Unpublished maps**, on the other hand, are normally produced as required for specific government projects and include survey maps for the construction of railways and airports, other maps of Indian reserves, maps showing federal buildings and other government land holdings, and some mining maps. Included in the "unpublished maps" category are the preparatory materials for maps published by the government, such as surveys, aerial photographs, satellite images, geomatic data files, plane table sheets and production elements, including colour separations and printing plates.



Example of an architectural record: ***Parliament Buildings, N° 6, Ottawa****. Fuller & Jones Architects, ca. 1859, 79-0032-29, South elevation. RG11M, Records of the Department of Public Works, NMC 104304*

In some instances, printed maps serve as base maps and are annotated during the preparation of maps that are not necessarily intended for publication.

The use of geomatic systems in cartography is increasing constantly. Covering all aspects of data collection, processing, display and the printing of maps or studies, geomatic systems include a number of subsystems or components such as geographic and topographic databases, graphic data files, place name files and delivery systems (printing). The National Archives acquires geomatic systems.[2]

Architectural Records

An architectural record or drawing is a pictorial representation of man-made structures intended to show how they will appear when completed. These drawings can represent a building before, during and after construction, or they may show structures that were never built. Considered important since early colonial times, architectural records include the military architecture of forts and fortresses scattered across the land, as well as the civilian architecture of official buildings and residences. Land surveys and topographic site plans of future buildings – in other words, maps – are often considered as architectural records.

Architectural records produced by government institutions include drawings of federal buildings such as post offices, embassies, hospitals, schools, penitentiaries, the Parliament Buildings, courthouses, experimental farm buildings, customs offices, national museums, railway stations and other railway buildings, grain elevators, RCMP and military buildings, airports and terminals, office buildings, pavilions for international and universal exhibitions in which Canada took part, community centres and other buildings on Indian reserves, etc.

2 David L. Brown, "Report on Geomatics for the National Archives of Canada," National Archives of Canada, Historical Resources Branch, Cartographic and Architectural Archives Division, November 1989 (unpublished).

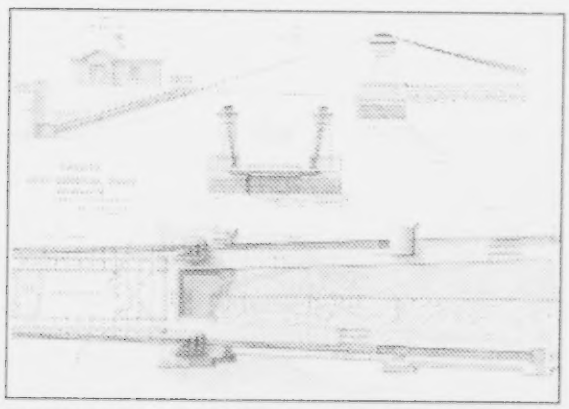
David L. Brown, *Geomatics and Archives: A Hands-On Approach*, a series of essays about electronic records at the National Archives of Canada, Terry Cook and Terry Eastwood, editors, Kluwer International Academic, Netherlands (to be published).

Most architectural records are on paper or linen. There are also drawings which are wholly printed by computers, known as computer-assisted drawings, and architectural records which are completely designed using computer software products and are known as computer-assisted design files.

Engineering Records

Engineering records, or technical drawings (e.g., cross-sections, details, diagrams, elevations, perspectives, plans, working plans, etc.), "include plans for the construction of proposed or actual stationary structures other than buildings (e.g., bridges, canals, dams), and movable objects (e.g., equipment, machinery, ships, tools, vehicles, weapons)."[3] Created for use in an engineering or other technical context, these records may also represent structures and movable objects at various stages of their design and construction.

Engineering records produced by government institutions include plans and drawings of canals and locks, lighthouses, bridges, ships and aircraft, military vehicles, weapons, gas and oil pipelines, laboratory equipment, radar installations and observatories.



Example of an engineering record: ***Details, Union Suspension Bridge, Ottawa River****. F. P. Rubidge. Scale 1:72. 1844. 85603/40. RG11M, Records of the Department of Public Works, NMC 16940*

Like architectural records, most engineering records are on paper or linen. There are also drawings which are wholly printed by computers, known as computer-assisted drawings, and engineering records which are completely designed using computer software products and are known as computer-assisted design files.

Formats

Cartographic Records

Some cartographic records represent the various stages in the production of maps, from sketches to final records, including plane table sheets, final copies, tracings and multiple proofs. Most are on paper, but there are also photographic records, electronic files and, in exceptional circumstances, records on metal, wood, stone, bark and animal skin. Records pertaining to published maps and geomatic systems fall into three categories: the data gathering stage (surveys), the data processing stage, and the production and copying stage. Not all of these types of records are necessarily found among the records produced by government institutions. Examples of the types of cartographic records for each stage are:

Data gathering stage (Surveys)

- boundary surveys
- cadastral plans
- hydrographic surveys (soundings and ultrasounds)
- field topographic surveys
- photogrammetry: aerial photographs
- remote sensing: satellite imagery

Data processing stage

- plane table sheets, drawings
- compilations
- base maps

3 *Rules for Archival Description*, Chapter 6, Rule 6.0A1, Bureau of Canadian Archivists, Canadian Council of Archives, 1995-2000.

- annotated screened negative aerial photographs
- transparencies
- geomatic systems

Production and copying stage

- tracings
- photomechanical reproductions (photostats, photocopies, blueprints)
- printing plates (wood, copper, zinc, steel, stone)
- maps printed on wood, copper, zinc, steel or stone, by offset lithography, etc.
- photolithographs (negatives, scribings, colour-separation negatives, photomechanical proofs)
- globes and globe gores
- atlases
- relief models
- manuscript maps on linen or paper and, exceptionally, on bark, parchment, silk, etc.
- CD-ROMS
- videodiscs
- geomatic systems

Architectural Records

Architectural records document the four stages in the production of architectural drawings: concept design, site survey, construction and post-construction. The types of architectural records for each stage include:

Concept design stage

- design proposals
- sketches
- schematic drawings
- perspective drawings
- presentation drawings
- three-dimensional models

Site survey stage

- plans

Construction stage

- working drawings of the building, equipment, heating, plumbing and air conditioning systems – including plans, cross-sections, details and elevations
- as-built drawings
- shop drawings
- key plans
- change orders

Post-construction stage

- annotated plans
- measured drawings, i.e., precise scale drawings of existing structures based on measure or mathematical calculation. (These types of drawings are produced when the measurements of a building for which the original drawings are no longer available or for which no plans were ever produced are noted down. Measured drawings were produced for a few national historical buildings.)

Construction and post-construction stage drawings may also exist as reproductions (blueprints, tracings, vandykes, electrostatic copies) in addition to the original drawings. There may also be several other formats of architectural records, such as computer-assisted drawing files, computer-assisted design files, descriptive text, photographic and audiovisual records (videos), each format being a portion of the complete record keeping of an architectural project.

Engineering Records

These records include concept design, construction or production as well as post-construction or post-production drawings. The formats for engineering records are very similar to the formats for architectural records.

Legislation and Policy

Cartographic, architectural and engineering records are governed by the same acts and policies that apply to all government information. These include:

Access to Information Act

Communications Policy

Emergency Preparedness Act

Government Security Policy

Management of Government Information Holdings Policy

National Archives of Canada Act

Privacy Act

Ownership and Copyright

It is important to remember that all cartographic, architectural and engineering records created or collected in the course of government work belong to the Government of Canada and, like other government records, must be included in the information management program of the institution that created them. Crown ownership also applies to cartographic, architectural and engineering records created with government funds, materials or equipment, either by government employees or by contracted individuals, unless otherwise specifically stated in contracts or agreements. In instances where private agencies or individuals have created cartographic, architectural and engineering records for government institutions, it is essential to preserve the original contracts so that the physical ownership, copyright and other legal specifications pertaining to the records can be established and demonstrated if required.

Control over the exhibition and reproduction of cartographic, architectural and engineering records will depend upon the assignment of copyright. It is important to note copyright restrictions, particularly for records which were not created or sponsored by a federal government department.

Need Advice?

For advice about the management of information recorded on other media such as motion picture films, microfilm and microfiche, art records, posters, photographic records or electronic imaging systems (videotape, still video, optical disc), please contact:

National Archives of Canada
395 Wellington Street
Ottawa, Ontario K1A 0N3
Tel.: (613) 947-1518
Fax: (613) 947-1500

II

Organizing Cartographic, Architectural and Engineering Records

Government institutions need to organize all their records so that information can be identified, located and retrieved quickly and accurately. The arrangement of cartographic, architectural and engineering records should be dictated by the nature of the records, the needs of the institution and the needs of the users. It will involve many decisions, such as choosing the best storage locations, selecting a classification scheme, assigning control numbers, and creating finding aids, indexes and other retrieval mechanisms.

A proper inventory of cartographic, architectural and engineering records will need to include any related documentation that explains the context of the records, including their relationship to government programs and activities. Related documentation could be a finding aid, including map indexes and indexes to architectural projects, a map report – geological maps and some other types of maps are often accompanied by reports –, field books, textual material accompanying or related to architectural drawings, etc.

The selection of an appropriate classification system will be based on a thorough knowledge of the institution's cartographic, architectural and engineering records, and of the way they are used.

File Location

Although many government institutions maintain an inventory of their corporate information holdings, cartographic, architectural and engineering records are often overlooked. Knowing what cartographic, architectural and engineering records an institution has and where to find them is the first step towards effectively managing these records. Institutions should attempt to locate all collections – large and small, active and dormant – and include them in their corporate inventory. Once the cartographic, architectural and engineering records have been located, it will be much easier to integrate them into departmental records management systems and disposition plans.

Often, cartographic, architectural and engineering records are stored together in groups. Items in a group may share a common origin or function, cover a similar subject or simply be kept together for the sake of convenience, for example, because the sheets are all the same size.

Although cartographic, architectural and engineering records are most likely to be found in the larger institutions that produce them (Natural Resources Canada, Fisheries and Oceans, Public Works and Government Services Canada, Transport Canada, Indian and Northern Affairs, National Defence, National Research Council of Canada, Parks Canada, etc.), they may also be found in other government institutions.

Cartographic Records

Published Maps and Charts

Published maps and charts are produced by mapping agencies such as Natural Resources Canada, specifically the Geological Survey of Canada (geological and geophysical maps), Geomatics Canada (topographic maps, aeronautical charts), *The National Atlas of Canada* (series of general maps, etc.), the Canadian Hydrographic Service at Fisheries and Oceans (hydrographic charts and geoscientific maps), Environment Canada (land use maps), Elections Canada (electoral boundaries maps), National Defence (military maps of cities and foreign topographic maps received by that department), Agriculture and Agri-Food Canada (soil maps), etc.

Other Printed Cartographic Records

Other printed cartographic records, not necessarily published by the government of Canada, may be found in departmental libraries, documentation centres and communications offices. They may include maps and atlases and, in rare instances, globes. Generally speaking, these cartographic records will be maps of Canada and its provinces, regions and cities; they could also be foreign maps and atlases, depending on the mandates of the libraries and documentation centres. All these records should be included in the institution's inventory of information holdings.

Non-Published Cartographic Records Related to Published Cartographic Records

This category includes all the cartographic records created during the preparation of published maps. Within map-production and map-printing departments, the offices responsible for these maps generally have complete files for all of them. This documentation also includes open files, for example, those found at the Geological Survey of Canada. These are complete cartographic files for the production of maps, although the maps are printed only if the institution identifies a need for them or receives a specific request for them. Although many of these files never resulted in the production of published maps, they remain a very important source of information.

Aerial photographs and remote sensing data, used in the preparation of maps, are kept by the National Air Photo Library and the Canadian Centre for Remote Sensing, which are part of the Department of Natural Resources. For information concerning the management of photographs, please refer to the 1993 National Archives of Canada publication entitled *Managing Photographic Records in the Government of Canada.*

Geomatic Records Relating to Published Maps

Geomatic records are created and used for the production of topographic, hydrographic and other maps of Canada. Geomatic records include geomatic systems, discs, CD-ROMs and other cartographic material in electronic formats.

Non-Published Cartographic Records Not Related to Published Maps and Charts

These records, produced by operational areas, are found in all government departments, but especially in those responsible for transportation, the acquisition, administration and sale of federal lands, rights-of-way on these lands, national territorial waters, census, etc.

Architectural and Engineering Records

Architectural records are mainly found in institutions and programs related to the construction of buildings, bridges, canals and waterways, lighthouses, wharfs, airports, military bases, railways and ships, and to the manufacture of equipment, machinery and armaments.

Registration

Once cartographic, architectural and engineering holdings have been located within an institution, they should be accounted for in the institution's records management system or in the inventory of its information holdings. For each group of records, list details such as:

- responsible department, branch or division
- name and purpose of group
- general contents, subjects covered
- creator, producer or source of the records
- storage location
- quantity
- media formats
- availability/existence of copies
- classification system used
- related records or documentation
- retention period

Numbering

The order in which cartographic, architectural and engineering records are physically stored can be based on any one of many criteria. The best control over a collection is achieved when each cartographic, architectural and engineering record – or block of records – is assigned a unique number, often called a shelf number, that dictates the physical order in which the records are stored. That number will assist in locating the record within the classification system, as well as any related documentation. For certain automated indexes and retrieval tools, item-level numbering of cartographic, architectural and engineering records is essential.

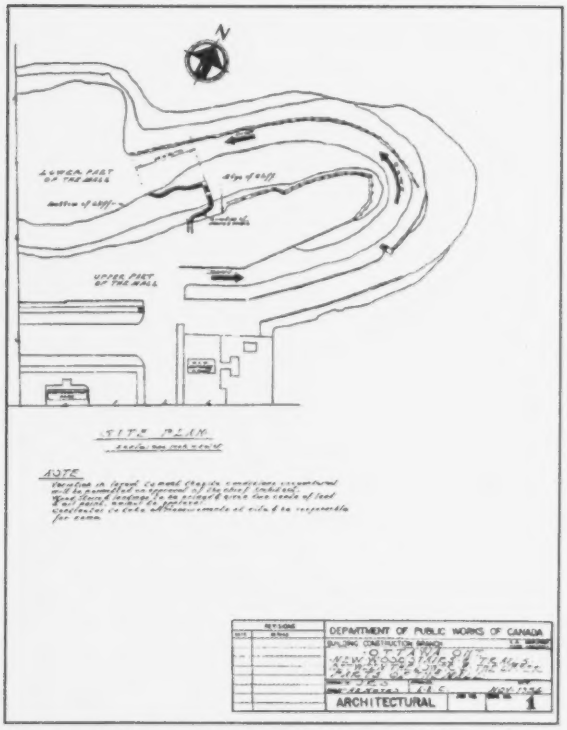
Sequential Chronological Numbers

In a sequential chronological file, the records are simply numbered 1, 2, 3, etc., according to the order in which they are created or acquired. The ability to add new materials makes this system practical for collections that are continually growing. Chronological files, however, require the maintenance of a master list in which basic information (source, date, subject, format) about each record or block of records is logged beside its file number. Subject indexes and cross-references must also be created to enable retrieval of records by criteria other than chronological order. A variation of the sequential numbering combines the year (calendar or fiscal) with sequential numbers. For example, with "713" being the sequential number, in the number 989-713, "989" represents fiscal year 1998-1999; in the number 990-713, "990" represents fiscal year 1999-2000; in the number 001-713, "001" represents fiscal year 2000-2001.

Incorporating dates into the numbering system is a useful practice since it will also help the disposition process by automatically identifying older records. Mnemonic codes made up of numbers, letters or alphanumeric combinations may be used to indicate any kind of information about the record – program, subject (e.g., topography, geology, oil, etc.), geographic location, format, source of the record or creator – that is considered important. Because it is essential to keep coding simple, mnemonic codes should only be used when there is a genuine need to store cartographic, architectural and engineering records in a specific order.

Sometimes, groups of cartographic, architectural or engineering records will have to be divided into subgroups, for example, if one portion of the records is contained in large folders, then another is made up of rolled documents stored in large boxes or folded maps in small boxes, and a third portion consists of atlases and other bundles of related maps. Each of the subgroups can be stored in a different place, but they should be linked by a common number.

It may be useful to number each of the records within groups and subgroups. Some records will obviously require a very specific classification system. For example, virtually all the maps printed by the government have their own grid pattern, and each sheet bears its own number. The sheets of the same series, therefore, need only be filed together by sheet number and date (there may be a number of editions of a single sheet). Groups of unpublished cartographic records should be filed together by program or project and, within each group, geographically by sheet number, when applicable, or by country, province, territory, region, city, etc., and by date within each of those categories. A collective number can then be assigned to each group of cartographic records.



On this architectural record, a site plan, the cartouche is placed at the bottom on the right-hand side. RG11M, Records of the Department of Public Works, NMC 121869

In general, architectural records should be grouped by project, in other words, by building. A cartouche[4] usually appears on each drawing, indicating the name of the project and the drawing number, the name of the architect and the draftsperson(s), the department involved, etc.; all these elements can be integrated into the institution's numbering system. If there is no numbering, drawings can be classified, for each project, from the simplest to the most detailed. Projects can be grouped by country, province, region and city, and the architectural records can be filed in chronological order within each project.

Similarly, engineering drawings can be grouped by project (fixed structures such as bridges or canals, or objects, machinery, vehicles, equipment, etc.) and the existing numbering system, if there is one, can be followed. Otherwise, drawings should be grouped from the general to the specific within each project and in chronological order if it is known.

Bar-Code Numbering

Bar-code numbering is another popular option, especially for large collections of cartographic, architectural and engineering records. Although bar-code readers involve an extra expense, bar codes offer the additional advantage of doubling as security tags. With each record having its own distinct bar code, cartographic, architectural and engineering records can be readily and unequivocally identified. The information associated with each bar code provides a more complete description of the record, its format, related documentation, geographic location, its link with the original record block, etc.

4 The cartouche, usually found on maps and architectural drawings, is a frame of reduced dimensions, indicating the title and possibly other information.

Labelling

Cartographic, architectural and engineering records, and their containers, should be permanently labelled with the shelf number, title, contents and other essential information. For the labelling of containers, archival suppliers sell permanent marking pens that do not fade and adhesive labels that will not come off over time. When generating labels using a personal computer, remember that the ink used in many dot-matrix printers can fade in a few years.

Each box, folder, tube and bundle should be labelled and, if time permits and the frequency of use justifies it, the records inside should also be labelled. It is not always necessary to label each and every record, but if this is to be done, a soft lead 2HB pencil should be used to write on the back of the records, **but never on the front**. Always label records lightly, as excessive pressure or a sharp point on the pencil will leave a permanent imprint on the record's surface. Records should bear a handwritten caption placed on the lower right-hand corner of the back or in another location that will not jeopardize the value of the record. In the case of an atlas, the third cover page may be labelled.

For globes and other three-dimensional records, it is preferable to attach to the item a small label with the necessary information.

Description

Preparing a description, which involves noting specified pieces of information about the content of a record, is a valuable activity that enhances the usability and future research value of the record. Within government departments and agencies, every effort should be made to ensure that all records or groups of records (generally, groups of records rather than individual records) are given at least a basic description by their creators or by the employees most familiar with their contents. Understandably, not all records require the same degree of description. The nature of the records, users' needs and available resources must be considered in determining the level of description. It may be that certain records will be described at the item level (e.g. atlases, globes, certain single-sheet maps, isolated presentation drawings) while others will rely on a collective description to provide the necessary context (e.g. series maps, groups of maps related to a specific project, groups of drawings related to one building or to an engineering project).

Some large groups of cartographic, architectural and engineering records lend themselves well to general descriptions as blocks of records. In order to refine the description within each group, the main components of the group may be emphasized (e.g., a list of the provinces and cities represented by the records, a list of principal buildings, a list of ship plans or other major categories represented). Individual descriptions for globes, atlases or records of special importance within groups may be prepared. Remember that undescribed cartographic, architectural and engineering records may over time lose the context of their purpose, creation and use. This is especially true if there is no related documentation or if there is no cross-reference to related documentation. As a result, cartographic, architectural and engineering records might have little or no value to the institution or to future researchers.

Descriptive Standards and Practices

Custodians in government institutions may find it useful to consult the various standards, guidelines and methods that have been developed by archives and libraries for the description of cartographic, architectural and engineering records. In Canada, the Canadian Council of Archives has published the *Rules for Archival Description (RAD)*. The description of cartographic materials is dealt with in Chapter Five, *Cartographic Materials*, and the description of architectural and engineering drawings is covered in Chapter Six, *Architectural and Technical Drawings*. The National Archives of Canada has adopted *RAD* as its institutional standard.

Rule 5.1B1c of *RAD*'s Chapter Five reads as follows:

> If the unit being described bears both a common or collective title and the titles of individual works, give the common or collective title as the formal title proper...

Example:
Plans exhibiting the obstructions to the navigation to the River Saint John and the several proposed works for their amelioration
(Collective title for 3 maps on 3 sheets)

Rule 5.5C5, "Illustrations, number of maps," states:

Record the use of illustrations, and give the number of maps in an atlas.

Example:
1 atlas (60 p.): ill., 33 maps

Rule 6.1E of *RAD*'s Chapter Six reads as follows:

At the series, file or item level of description, transcribe other title information...

Example:
Rectory of Sainte-Hélène, Montreal
[General Material Designation]:
alterations and heightening

Rule 6.5C5 of the same chapter, titled "Material," reads as follows:

Give the material of which the unit being described is made if considered to be significant (e.g., if on a substance other than opaque paper).

Example:
53 architectural drawings: 38 ink and pencil on tracing paper (1 in col.), 8 brownline prints (5 in col., 3 on cardboard, 5 dry-mounted), 6 blackline prints and 1 mylar

The *Anglo-American Cataloguing Rules* (AACR2R)[5] is another widely used standard. A manual entitled *Cartographic Materials. A Manual of Interpretation for AACR2*[6] was published for the interpretation of these rules as they apply to cartographic records.

Collective-Level Description

In a collective-level or group-level description, the main descriptive elements are the shelf number, group title (create one if none exists), the date range (date of the oldest record in the group followed by the date of the most recent), the name of the program, creator and institution, technical features (e.g., components of the group such as "maps only" or "maps and atlases," architectural drawings, engineering drawings) and the subject headings covered by the documentation. Collective-level descriptions are useful for compiling a comprehensive inventory of the institution's holdings.

Item-Level Description

Once a collection or group has been described, item-level descriptions may be necessary, for example, when a globe is part of a collection of flat paper maps. The item-level description would indicate the record's shelf number, title, date, subject, creator and technical features (i.e., the format of the item: map, architectural drawing, atlas, globe, etc.).

Related Documentation

It is also important to record the links that exist between cartographic, architectural and engineering records and the related textual documentation. When the cartographic, architectural or engineering records and their related documentation textual files are stored separately, a note should be placed on all the cartographic, architectural or engineering records' enclosures, indicating the number of the textual documentation file; similarly, a note should be added to the textual documentation file, stating the identification numbers of the cartographic, architectural or engineering records. In addition, all information related to the creator, such as contracts specifying intellectual ownership and copyright of the material, is of paramount importance and should be held in the related documentation files.

5 *Anglo-American Cataloguing Rules*, American Library Association *et al.*, American Library Association Editions, second edition, 1998 revision.

6 *Cartographic Materials. A Manual of Interpretation for AACR2.* Prepared by the Anglo-American Cataloguing Committee for Cartographic Materials. Hugo L. P. Stibbe, General Editor, Vivien Cartmell and Velma Parker, Editors. Chicago, American Library Association, Ottawa, Canadian Library Association, London, The Library Association, 1982. (New edition under way)

Indexes and Retrieval Systems

An index is a valuable tool for organizing, locating and retrieving cartographic, architectural and engineering records, especially in large collections arranged numerically. The choice of index should be based on the retrieval needs: do users search for records by region, title, subject, or program activity? Subject indexing is particularly useful for heterogeneous blocks or groups of cartographic, architectural and engineering materials. A subject index allows users to search for records under specified subject headings or keywords. Some automated systems also allow full text searching. Remember that the descriptive information created about each cartographic, architectural or engineering record or group of records provides the foundation for the index.

A card index is a manual retrieval system that works relatively well for small collections of cartographic, architectural and engineering records. The file number and subject information are recorded on standard-sized cards (75 mm x 125 mm or 125 mm x 200 mm) which are then placed in a master file, organized by number or subject. Larger cards (125 mm x 200 mm or larger) may also accommodate a small photographic copy (e.g., 100 mm x 125 mm) of the cartographic, architectural or engineering record. Caption sheets allow users to scan descriptive information about the collection in a portable binder. Since caption entries are generally listed chronologically, caption sheets are best suited to smaller collections.

Automated retrieval systems are a practical alternative to card and other manual indexes. Faster and more flexible than manual indexes, they can provide access from a variety of points, depending on the number of information fields that can be searched.

With commercial database software or a specifically designed software package, most collections of cartographic, architectural and engineering records can be easily handled on a personal computer or mainframe.

Ask the computer specialists in your institution how a visual database can be integrated with the other information systems currently in use.

Geographical Index

The geographical index is the most useful type of index for cartographic records. "Do you have a map of this city, of this area?" This is the question most frequently asked by researchers. It is easy to design a geographical index: information on cities, regions, electoral districts, and other natural and administrative divisions can be grouped by province and territory. The geographical index can then refer to all the maps contained in the records for a particular province or city. On each individual index card, the following information will appear: the name of the geographical location represented in the record, the shelf number for each record or group of records, and the file number of any related documentation.

Building Type Index

The most useful index for architectural drawings is an index by building type. Several institutions, including the National Archives of Canada and the United States National Archives and Records Administration (NARA), use this kind of index, which is based on the terminology of the American Institute of Architects. The list of buildings[7] comprises 30 major categories, each subdivided into many other groups. The government buildings category is divided to reflect all the types of buildings that a government is likely to own (legislative and customs buildings, post offices, courthouses, embassies, etc.). For each building represented in the group to be indexed, enter the building type number indicated on the list and the shelf number of the record, as well as the file number of any related documentation.

7 *Building Type List* – Contact the National Archives of Canada, Cartography and Architectural Division.

Index for Engineering Drawings

A good index for engineering drawings can be based on the broad categories of these types of drawings, which include bridges, canals, dams, machinery, vehicles, aircraft, ships, weapons, equipment, etc. For each category, details of individual projects can be entered including the name of the category, the shelf number of the record or records belonging to that category, and the file number of the related documentation. Bridges, canals and dams can also be included in a geographical index.

In several government institutions, conventional index cards or lists have been replaced by automated indexes that are quicker, more user-friendly and more accessible.

Videotapes, Videodiscs, Digital Imaging and Microfilm

In recent years, sophisticated technologies such as videotape, videodisc and digital imaging have been developed and adopted by a number of large archival repositories and government institutions. Scanning or recording cartographic, architectural and engineering records allows government institutions to protect the original records from excessive handling, in addition to offering many advantages for the users, such as quick visual access to a collection, enhanced presentation on monitors and, in some cases, the ability to manipulate the electronic image. A collection could then include multiple examples of scanned images in different media, thereby reducing the amount of time required to view or study the collection. Some departments are also turning to in-house desktop publishing to import digitized or scanned images into the textual portion of their products, thus enhancing the product and making it more interesting and user-friendly. Managers or custodians of large collections of cartographic, architectural and engineering records which are used frequently might consider having their records scanned or digitally imaged. For collections that constantly need updating or are rarely used, however, the expense would likely not be warranted.

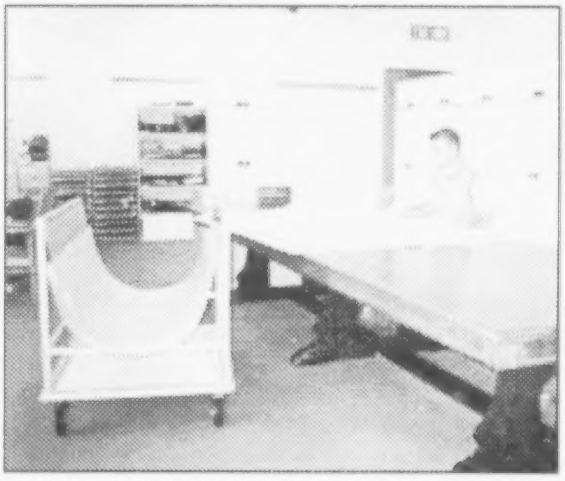
Microfilm, rolls or microfiche, is always an excellent method for reproducing records. The 105 mm microfiche (on which a *single* document is reproduced) is especially convenient for the reproduction of large records, although the cost of the camera and its operation is prohibitive for most organizations. The fiche can then be filed in any predetermined order and thus constitute a useful visual control and retrieval index. To a large extent, microfilm still provides better resolution than more modern technology, but there are constant and rapid changes in that field.

Preservation of Cartographic, Architectural and Engineering Records

What is the life span of cartographic, architectural and engineering records? The answer depends on several factors that affect the survival and integrity of the records, such as the nature of the medium, storage conditions, and the way the records are transported, handled and used. By properly protecting their cartographic, architectural and engineering records throughout their life cycle, government institutions will ensure that the information contained in these records will remain available as long as it is necessary and useful.

Formats

With the exception of atlases, globes and microcopies, cartographic, architectural and engineering records usually have a common format. They are large, often very large records, on paper or on linen; they may be printed, in the case of maps, or manuscript, in the case of maps, architectural and engineering drawings. It is in fact the large size of these records which represents the greatest danger to their proper preservation. People have a tendency to roll them up into small rolls and then pack the rolls into boxes that are too small; or else, they will fold them up to three times or more and store them in boxes and filing cabinets that do not provide proper protection. In many instances, the records will be left and forgotten on shelves in dusty areas where unclean, hot and humid conditions are not conducive to their proper preservation. When it's time to consult the records, there is usually not enough space or no large empty tables to do so safely. Generally speaking, very few people know exactly how to handle cartographic, architectural and engineering records properly, and yet it is extremely important that these records be handled carefully and safely, and stored in specific conditions.



Protected by its folder, the cartographic record is brought in the cart to a large, clean and uncluttered table where the researcher, always wearing white cotton gloves, can examine it.

Handling Guidelines

The handling of cartographic, architectural and engineering records, while inevitable, can be a major cause of damage. In the course of daily operations in government departments and agencies, cartographic, architectural and engineering records will be received, processed, filed, retrieved, photocopied, circulated, sent out, displayed or projected, then returned and refiled. Since the risk of damage increases every time the records are handled, original and precious materials should be protected from excessive handling and, whenever possible, reproductions should be used for reference purposes.

The following handling practices are recommended for all types of cartographic, architectural and engineering records and should be observed whenever possible:

- *Avoid touching the records, especially the surface.*
  If you have to touch the records, wear clean 100% cotton gloves; these gloves are reasonably priced and available from specialized suppliers.

- *Handle the records gently, and one at a time.*
  Always handle the records with both hands to avoid damaging them. If you have to move them, lift them up, then slide them onto the surface where they will be consulted. Never flip or leaf through cartographic, architectural or engineering records as if you were turning magazine or newspaper pages. If the record is protected with tissue paper, remove the paper by lifting it instead of dragging it across the record's surface. If required, use viewing aids such as page turners, magnifying glasses and book easels or book supports.

- *Never write on the front of cartographic, architectural or engineering records.**
  (*See also "Labelling" on page 11)

  It is often necessary to identify the records with a caption or annotation. It is of course preferable to record any descriptive information in a finding aid, stored separately from the documents. Annotations can be made on folders and other containers of cartographic, architectural or engineering records. When making annotations on the records themselves, write only on the back, usually in the lower right-hand corner, and use a soft lead 2HB pencil. Any writing on the front of a record can alter its original appearance. Never press hard on the pencil.

  The use of self-sticking, coloured notes on cartographic, architectural or engineering records – a common office practice – is to be strictly avoided, because the glue can trigger an adverse reaction with the record's medium.

- *Do not attempt to remove labels and stamps from records.*
  Professional conservators alone are qualified to do this and anyone using the wrong method or the wrong instruments could cause irreparable damage to the records.

- *Never use paper clips, tape, elastic bands, inks or felt-tip pens when handling and filing cartographic, architectural or engineering records.*
  All these items can cause serious and, in many instances irreversible, mechanical or chemical damage to records. The ink's chemical compounds may leach through paper, linen or fabric and can permanently stain the record, eventually destroying the image.

- *Minimize exposure to light.*
  Light has a highly destructive effect. Ultraviolet rays, emitted mainly by the sun and fluorescent lighting, are extremely harmful and will quickly cause the records to fade. In addition to their photochemical effect on paper, cotton and ink, ultraviolet rays split the fibres in paper, causing it to turn brown and become brittle. Incandescent light and the sun's infrared rays give off heat which dries out the records' media: paper can then shrink, split and curl. If a record has to be exposed to light for a fairly long time, light intensity should not exceed 50 lux.

- *Cartographic, architectural and engineering records must be well protected and packaged for mailing and transport.*
  If records have to be sent in the mail or transported over any distance, make sure they are encased in a protective enclosure. Special boxes and carts (familiarly referred to as "U-boats") have been designed for transporting large records and preventing the edges from being damaged in transit. Since the bottoms and sides of these carts and boxes are generally U-shaped, the records never lie flat; their sides are raised and hug the gentle curve of the bott[illegible] This prevents their edges from rubbing or bum[illegible] against the sides of the box. Records placed in these carts and boxes must first be enclosed in clean folders. If the same carts are used to transport tubes and rolled records, make sure that the edges of the records do not press against the sides. At all times, avoid transporting too many records in a single box or cart.

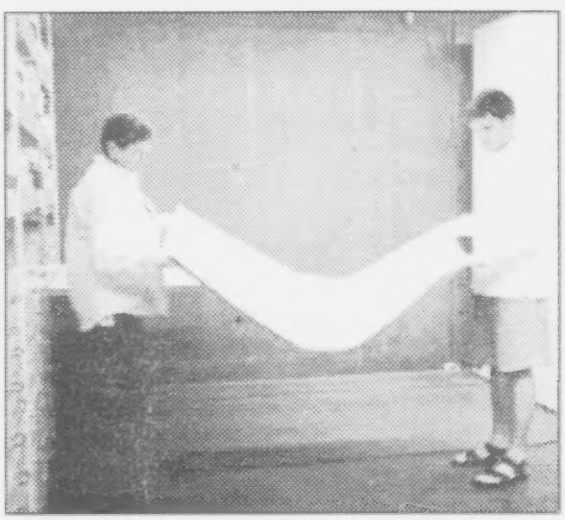
These carts are specially designed to carry tubes and large records.

When moving records, first place them in a folder of the proper size, in other words, a folder larger than the records; then, hold the folder gently but firmly by both ends. If the records are very large, it will take two people to move the folder safely. When moving rolls and tubes, carry them horizontally and be careful not to damage the ends.

- *Prevent any damage that could occur while cartographic, architectural or engineering records are being reproduced.*
  Generally speaking, cartographic, architectural and engineering records should not be photocopied. Most of them are much too large for the commercial photocopiers used in offices and there is a very high risk of damaging them while attempting to slide them onto the photocopying plate. In addition, the photocopier's heat and intense light can weaken records. If a specific item is frequently requested, have it copied professionally to obtain either a reproduction, a negative or a transparency made from a photograph, or a microfilm (preferably 105 mm). From then on, use the copy as the master when further copies are required.

- *Prohibit food, beverages and smoking in any area where cartographic, architectural and engineering records (or any other records) are handled or stored.*
  This rule should be enforced in areas where cartographic, architectural and engineering records – or any record for that matter – are stored or handled. Spilled drinks and crumbs will not only damage the materials themselves, but may also attract insects and rodents. Cigarette smoke can also damage certain materials and dropped ashes can cause burns. (Smoking is now prohibited in all federal buildings.)

- *Ensure that the premises where cartographic, architectural and engineering records are used are clean.*
  Dust, dirt and soot are mechanical and chemical agents of deterioration. Their particles may be acidic or contain polluting gases. When working with cartographic, architectural and engineering records, make sure that you have access to clean, uncluttered surfaces that are large enough to accommodate the record, no matter what its size. Floors should be swept and washed frequently.



It always takes two people to move large cartographic records.

- *Do not remove maps and drawings from their frames nor remove the wooden rods attached to the top and/or bottom of wall maps.*
  This type of work must be left to professional conservators, particularly as frames and rods have a historical importance that must be preserved.

Storage

The long-term survival of cartographic, architectural and engineering records depends to a large extent upon their storage conditions. When selecting an appropriate storage system for these records, information managers and conservators should take into account user needs, growth rate of the collection, departmental resources and the principles of archival preservation. The long-term storage needs of dormant collections will have to be taken into consideration when the retention and disposition schedules are being determined.

Standards[8]

A few publications dealing with general preservation and storage issues provide practical information on cartographic, architectural and engineering records. For example, Mary Lynn Ritzenthaler's book, *Preserving Archives and Manuscripts*,[9] is excellent and exhaustive; another useful publication, *Preservation of Library & Archival Materials: A Manual*,[10] edited by Sherelyn Ogden, is also available on the Northeast Document Conservation Center's Web site, *www.nedcc.org./plam3/manhome.htm*.

Other useful information can be found in *CCI Note N11/2*, "Storing Works on Paper," Ottawa, ca. 1995, published by the Canadian Conservation Institute.

Institutions that hold cartographic, architectural and engineering records generally abide by the standards and practices recommended in these publications.

The International Institute of Conservation – Canada Group (IIC-CG) –, the umbrella organization for several international associations of conservators, as well as the National Archives of Canada can also provide advice and assistance regarding the maintenance and storage of cartographic, architectural and engineering records.

Environment

The storage conditions described in this chapter, including those covering temperature, relative humidity, light and cleanliness, are those generally maintained in archival repositories, map libraries and architectural museums. While it may not always be possible to duplicate these conditions in government institutions, every attempt should be made to approximate them as closely as possible, including the use of recommended cabinets and shelving.

Storage Rooms

The areas where storage cabinets and shelving are located must be fairly spacious, because cartographic, architectural and engineering records are usually quite large and take up a considerable amount of space. Enough space must be left in front of cabinets and shelves so that the drawers can open fully and that folders and boxes can be removed easily.

Storage areas should not be located in basements or other places where temperature and humidity levels are excessively high or unstable. Areas prone to insect infestation and animal intrusions should also be avoided.

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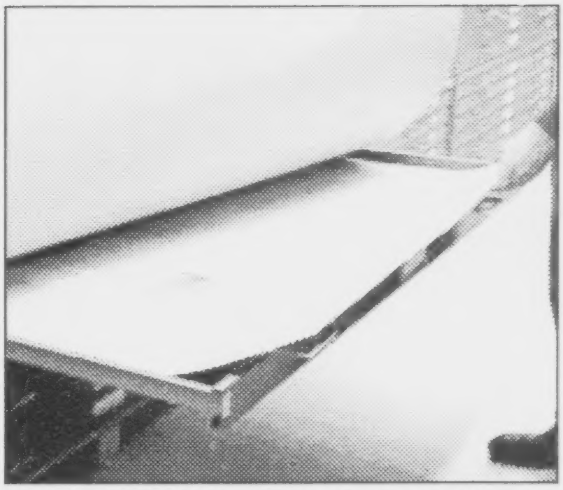
8 The remainder of this chapter is based on the conservation section of *A Guide to the Archival Care of Architectural Records, 19th-20th centuries* (Architectural Records Section, International Council on Archives, Paris, 2000).

9 Mary Lynn Ritzenthaler, *Preserving Archives and Manuscripts* (Archival Fundamental Series. Chicago: Society of American Archivists, 1993).

10 *Preservation of Library & Archival Materials: A Manual*, ed. Sherelyn Ogden (Andover, Mass., United States, Northeast Document Conservation Center, 1999, 3rd edition).



It is very important to leave enough space in front of the cabinet so that the drawers can open fully.

Temperature and Humidity

Variations in temperature and excessively high relative humidity are the two main causes of record deterioration. Temperature and humidity fluctuations, especially sharp changes, are even more dangerous than a stable environment with sub-standard climate control. If records are stored in a closed room, temperature and humidity can be controlled relatively well with a thermostat-controlled heating system and small air conditioning units and humidifiers (or dehumidifiers, as the case may be), preferably industrial-grade devices. Check relative humidity every day using a hygrothermograph or sling psychrometer. Because conditions should remain constant at all times, it is essential not to shut off heating or air conditioning in the storage areas after office hours.

Light

Light accelerates oxidation and other chemical reactions. Photographic and magnetic records require specific light, temperature and humidity conditions; if exposed to light, they are more severely affected than paper records. It is therefore important to separate photographic and magnetic records from paper records.

Incandescent lighting should be equipped with an ultraviolet filter. Cover the windows with this type of filter, or at least with blinds. As photographic records are extremely light-sensitive, even when UV filters are installed, they should not be exposed to light except for brief periods of time.

Pollutants

Every possible effort should be made to protect cartographic, architectural and engineering records (especially related photographic records) from pollutants such as nitrogen oxide, sulfur dioxide, peroxides and hydrogen sulfide. Since oil-based paint fumes can also damage the records, latex- or acrylic-based paints should be used in storage areas.

Insects, Rodents and Micro-organisms

Insects and vermin may be present in the records when they are received or they can appear at a later date. Drawn to dark, warm and humid areas, they are also attracted by the cellulose of paper, the mordants and gelatin in paper, the starch used to coat linen on which many architectural drawings are produced, as well as glue and leather.

Rodents – mice, rats, field mice and squirrels – eat paper and use it to make nests. Screens, traps and regular inspection of the premises will help minimize rodent damage.

Micro-organisms, fungi and moulds are naturally present in the air and develop when conditions are favourable. Avoid high heat and relative humidity, darkness and lack of ventilation.

Specific Types of Records

- Paper and Linen Records

  The recommended storage temperature for records on paper and linen is 18°C. Relative humidity must be maintained at approximately 40%.

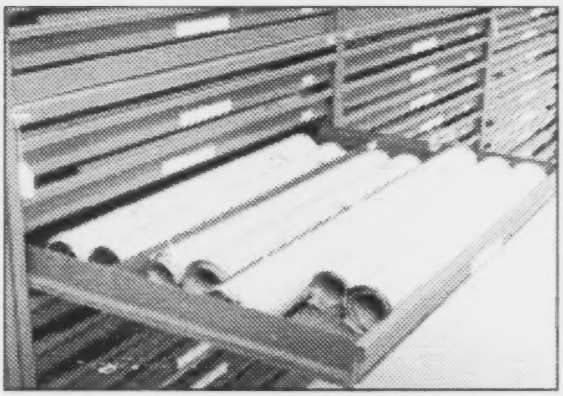
- Photographic Records

  For photographic records (photographs, blueprints, ozalids, line printing, etc.), a temperature of 18°C and a relative humidity of 25% are recommended. If the archival fonds is composed of several types of photographic records (negatives, engraving plates, transparencies, slides, etc.), a relative humidity level of 30% is recommended.

- Records on Magnetic Tape

  For magnetic tapes, temperature must be between 18 and 22°C, and relative humidity must be 40%. Always protect these records from direct exposure to sunlight.

  Ensure that there are two copies of each tape, and that each copy is stored in a different location. The air in the storage room must be dust-free and filtered to 50 microns. Recopy the tapes at intervals dictated by current technology (presently five years) and, where possible, rewind and clean them each year with a special device.



Rolled records should always be stored horizontally.

A storage vault, National Archives of Canada, Gatineau Preservation Centre, Gatineau, Quebec.

Cabinets and Shelving

Wherever possible, cartographic, architectural and engineering records should be stored flat. Do not fold them and never cut them to fit the dimensions of a storage drawer. Folding and unfolding quickly weakens the records. Those records likely to be used often should never be folded. Records that are already neatly folded and seldom used, however, may remain folded as long as they are kept in clean folders and stored loosely in boxes or cabinets. If an oversize record is too large for flat storage, you might consider rolling it loosely in order to be able to store it. You may also microfilm frequently used records and then use only the microcopies.

Several types of storage are available: horizontal cabinets, shelving, tubes, etc. The choice will depend on available space and budget considerations.

Steel is the most highly recommended material for storage cabinets and shelving. High-quality steel is clean, smooth and easy to clean; it reacts fairly well to changes in temperature and humidity. In addition, it does not retain humidity as do wood and cardboard,

does not attract insects, worms or rodents, and will not provide an environment conducive to the growth of fungi and moulds. The steel that is most recommended has a powder-coated, anodized-aluminum or baked-enamel finish. In all cases, the finish must be smooth.

Cabinets and shelving should be raised 15 cm from the floor. This is a good height for protection against flooding; should a flood occur, the space prevents water, when it recedes or is removed, from adding mechanically to the chemical damage already caused by humidity. Leaving some space between the floor and the cabinets will also provide access for forklifts should the cabinets have to be moved.

Horizontal Cabinets

Horizontal cabinets with drawers are well-suited to the storage of the majority of large records. In general, cabinets measuring 121 cm x 94.6 cm x 42 cm are the most practical. They usually have five or ten drawers, with interior dimensions of 112 cm x 88 cm x 2.5 cm; each drawer can hold one stack of records widthwise or two stacks of smaller records side by side lengthwise. Institutions should select the size of cabinets that is best suited to the average dimensions of the maps and plans they hold. All drawers should operate on ball bearings, given that gliding drawers are often hard to open.

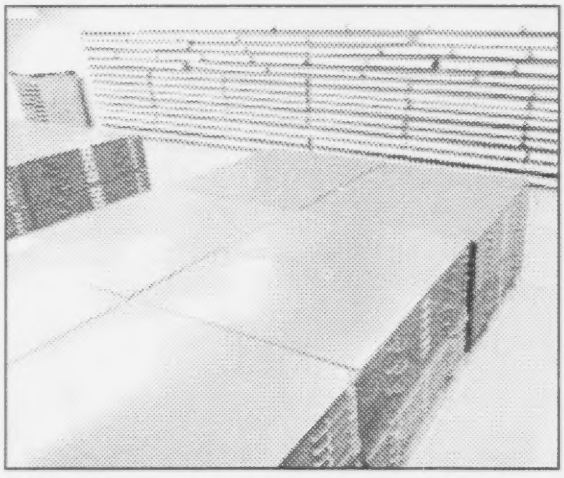
It is preferable to choose cabinets with shallow drawers (approximately 2.5 cm to a maximum of 5 cm). Each drawer can hold up to 60 records, depending on their value and fragility, on the number of folders used and on whether or not a sheet of (non-acidic) tissue paper is inserted between the records. There should be no more than 12 records per folder. The number of sheets of tissue paper in each folder will depend on the thickness and artistic value of the records. Each drawer should hold a maximum of four to five folders.

Deep-drawer cabinets, with depths of 5 cm or more, are not recommended. With drawers that deep, there is too much pressure on the records at the bottom, withdrawal and filing are awkward, and drawer management also becomes an arduous task.

Many cabinets have ten drawers each (with handles offset, rather than aligned, for ease of use) and are stackable. Stacking two cabinets, one on top of the other, is a good idea since the top of the upper cabinet can then be used as a work surface. Stacking more than five cabinets, however, makes filing and retrieval difficult. The height of the stacked cabinets can also become a safety hazard for staff.

The best cabinets have a movable hinged flap in the front of each drawer to keep records in place and to prevent them from being damaged when the drawer is opened and closed. There must also be a small horizontal flange projecting above the back of the drawer to prevent records from overflowing and falling out of the drawer. In addition, cabinets should be equipped with stops to prevent the drawers from falling out of the cabinet when fully opened and when the cabinet is in transit.

Oversize cabinets, with dimensions greater than 249 cm x 153 cm x 31 cm, are not recommended. These large cabinets, usually equipped with three drawers, are very heavy and take up too much space. Filing becomes difficult because at least two people are needed to support the records during filing and withdrawal. These



Cabinet tops provide a good work surface. In the background are rolled records, stored in tubes and hung on pegboard panels. National Archives of Canada, Renfrew Preservation Centre, Renfrew, Ontario.

cabinets, however, may be a good choice if an institution owns a small number of very large fine maps and plans. Also, rather than purchasing an oversize cabinet, an institution could consider rolling its records or laying them flat on large shelves.

Shelving

Open metal shelving is also a good storage solution and some institutions believe that it allows for better use of space than drawer cabinets. Shelving also makes it easier to store and retrieve boxes of records.

Designed to hold boxes measuring 92 cm x 122 cm (36 x 48 inches), the shelves usually measure an additional 2.5 cm on the sides and top.

One box will hold approximately 100 records, divided into ten folders. Two people are required to handle the boxes, which are stacked two per shelf. For very large records, consider even larger shelves on which records can be stored in portfolios made from two pieces of non-acidic cardboard. Very large maps and plans should be rolled for storage.

Tubes

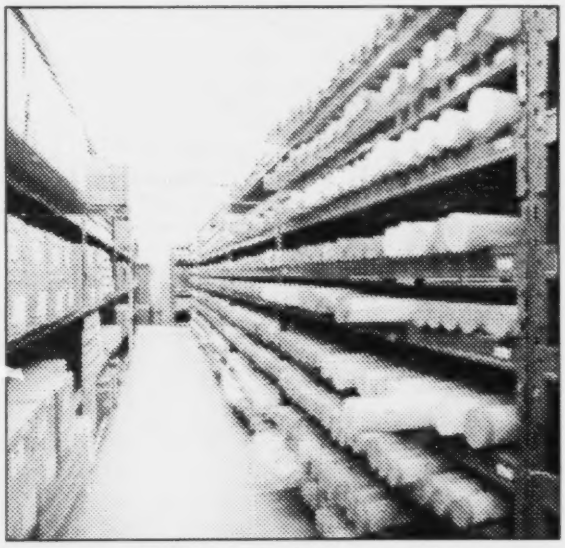
Architectural drawings are often too large to be stored flat. They are often received in rolls, however, and there is neither the time, the resources nor the space to unroll them and store them flat.

There are a number of fairly safe ways to store rolled documents. To prevent damage, rolls should not extend beyond the ends of the shelves and should always be stored horizontally, never in an upright position. Never stack rolls one on top of the other as this will crush the records and also make storage and retrieval more difficult.

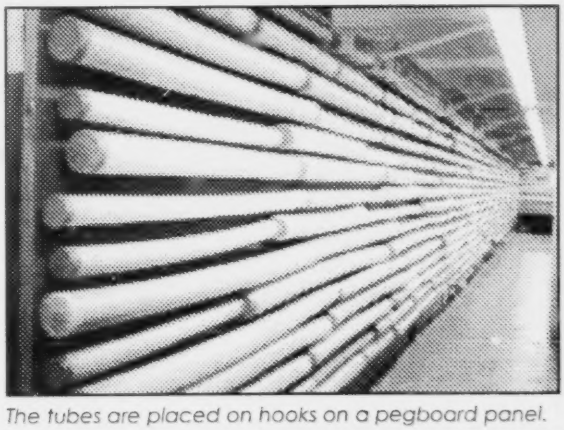
The only records that can be rolled are those on flexible media, for example, linen, polyester film (mylar), and supple paper of high quality and in good condition. Never try to roll delicate records on brittle, thick or rigid paper, or on cardboard, or composite records.

Rolled records may be stored in a single row on the same kind of shelves as those used for large folders. Shelf storage is an especially good idea for small rolls that are not encased in tubes.

The best way to store a large record in a roll is to wrap it around a rigid alkaline (neutral) cardboard tube. To prevent the record from being rolled too tightly, the tube's diameter must be approximately 10 cm to 12 cm. Once the record is wrapped around the tube, it is then wrapped with opaque non-acidic paper and a 100% cotton ribbon is tied around the



Open metal shelves can easily accommodate boxes and tubes.



The tubes are placed on hooks on a pegboard panel.

tube. A rod is then slipped through the tube, extending a few inches at each end; the tube is then suspended by the two extremities of the rod from hooks on a pegboard wall.

You may also store rolled records, one or more per roll, in inert polyurethane plastic tubes 10 cm to 12 cm in diameter. These tubes come in various lengths and can be cut as required. Before inserting the roll into the tube, cover it with non-acidic paper and tie it at both ends to prevent it from unrolling once inside the tube. The tubes are then placed on hooks on a pegboard panel. The ends of the tube are closed with a cap that is perforated to allow air circulation and fits over the exterior of the tube.

Vertical Cabinets

In a vertical cabinet, the records are hanging and therefore subjected to constant tension. The most common type of vertical cabinet features a front panel that inclines outward; both the movable part and the fixed part are equipped with two long metal rods from which the records hang. While this type of cabinets does make filing and withdrawal of records fairly easy, there is a constant danger that the records will be scratched and even torn on the suspension prongs. The use of vertical cabinets is therefore not recommended.

Vertical cabinets are not recommended.

Atlases, Globes and Relief Models

- Atlases

  Atlases should be stored on shelves. Generally speaking, atlases measuring up to 30 cm in length may be stored upright while larger ones may be laid flat. Depending on their age, size, weight and condition, two to three atlases may be stacked.

- Globes and Relief Models

  Globes and relief models should also be stored on shelves. Leave enough space between the items so that they can be easily moved without hitting one another or the sides of the shelf.

Inspecting for Signs of Damage and Deterioration

Even if you handle your cartographic, architectural and engineering records with the utmost care and store them in the best conditions, it is always a good idea to inspect them periodically, especially if the records belong to collections of large-sized and dormant documents.

With regular inspections (for instance, every three years), the early signs of damage will be detected before deterioration has reached the extent to which the record becomes unusable. Inspect a sampling of records and look for the signs of damage and deterioration listed on the next page. Keep a note of the physical condition and readability of each record inspected.

- browning or yellowing of the paper
- discolouration
- dryness or brittleness of the support
- crumbling surface varnish and paper
- mould
- rust caused by staples and paper clips
- holes made by worms and insects
- water and glue stains
- tears

Check with a qualified technician to see if damaged material can be salvaged and whether it should be recopied.

Several publications listed in the bibliography (Appendix B) provide sound advice on storage, handling and environmental conditions. Mary Lynn Ritzenthaler's *Preserving Archives and Manuscripts*[11] is one of the most exhaustive and practical books on this topic.

Disaster Preparedness

Since floods, fires, earthquakes and other misfortunes do happen, a written contingency plan should be in place to deal with the effects of unforeseen disasters. This plan should outline the procedures to follow in the event of an emergency, list sources of supplies and equipment for recovery operations, name persons with recovery expertise and list the materials to be recovered, with priority given to vulnerable materials. These procedures should be made available to all employees.

Recovery

Because of their diverse make-up and sizes, cartographic, architectural and engineering records will often require different salvage procedures than other paper records. Institutions requiring further information on disaster preparedness and recovery can contact the Disaster Control Organization of the National Archives of Canada and the Canadian Conservation Institute. The Response Action Team of the National Archives of Canada can also assist in the recovery and salvage of cartographic, architectural and engineering records.

Essential Records

Cartographic, architectural and engineering records may constitute part of the essential records of a government institution. An Essential Records Program is designed to ensure the identification and preservation of information that will allow for the continued availability of essential services, programs and operations. The Essential Records Program allows government institutions to prepare for recovery from contingencies, defined as any event that may interrupt an operation or affect service or program delivery.[12] Treasury Board requires government institutions to take the following steps:

- identify and protect their essential records
- store essential records in a secure site administered by the National Archives of Canada.

For further information on the policy requirements, consult the *Guide to the Preservation of Essential Records*, published jointly by Emergency Preparedness Canada and the National Archives of Canada.

11 Mary Lynn Ritzenthaler, *Preserving Archives and Manuscripts* (Archival Fundamental Series. Chicago: Society of American Archivists, 1993).

12 *Business Resumption Planning: Technical Standards*, Treasury Board of Canada Secretariat, Ottawa, 1992.

IV

Retention and Disposition of Cartographic, Architectural and Engineering Records

How long should government institutions keep their cartographic, architectural and engineering records? It is up to each federal department and agency to decide on the management of these records, especially when infrequently used documents take up valuable and expensive office space. The best way to control the accumulation of records is to plan for their retention and disposition. The organized retention and disposition of government information not only helps institutions make the most efficient use of their space and equipment, but also ensures that worthless records are destroyed while records of archival and enduring value are preserved. An organized retention and disposition plan is especially important for cartographic, architectural and engineering records because they are often not considered to be government records.

Retention Periods

Retention periods for cartographic, architectural and engineering records will be determined by their operational and legal value to your institution. Keeping unnecessary records will create a burden on resources, could impede the retrieval of essential information and also delay researcher services, thus going against the government's stated priority of service to the public.

It is good business practice to determine retention periods for cartographic, architectural and engineering records as early as possible following the creation of the records. Retention periods will vary according to the nature of the collection or the records. The retention periods established for cartographic, architectural and engineering records may be different from those established for the related files or reports. While paper-based information, for example, may also be available in electronic form, cartographic, architectural and engineering records, on the other hand, are often the sole sources of unique visual information. In cooperation with the creators of the records, information management staff in each institution can set reasonable retention periods for their cartographic, architectural and engineering records.

For guidance on the legal value of cartographic, architectural and engineering records, consult the legal counsel in your institution. Cartographic and engineering records may consist, for instance, of maps drawn by geologists that point out the exact geophysical locations of mineral deposits. As such, the documents will have a legal value because they can be used to determine the location of mining claims and to provide evidential value in boundary or property disputes.

The following points should be considered when determining records retention schedules for cartographic, architectural and engineering records:

- Ensure that all cartographic, architectural and engineering records are organized under a comprehensive classification system that will facilitate reference and retrieval. A good inventory of these records will also help to identify and locate records of enduring value.
- Set retention periods for all cartographic, architectural and engineering records as early as possible in the information life cycle and preferably at the same time as for other records related to a particular program, function or activity of a government institution.

Dormant Records

A cartographic, architectural or engineering record becomes dormant when the frequency of activity no longer warrants its being kept in expensive office space. For example, cartographic, architectural and engineering records relating to a specific project or case that has been concluded can be considered dormant. At that time, they can be moved out of operational areas to a storage location in-house or to an off-site records centre. Keep in mind that cartographic, architectural and engineering records require special conditions to survive in dormant storage. The National Archives of Canada provides off-site storage facilities for government records through a national network of Federal Records Centres (FRCs). For more information about storing cartographic, architectural and engineering records, please contact the FRC in your region (see the list in Appendix C).

Disposition

Disposition is the process that determines what happens to the records no longer needed by government institutions. In the Government of Canada, the disposition of records of government institutions and ministerial records is dictated by the *National Archives of Canada Act* (1987). This Act requires government institutions to:

- obtain the approval of the National Archivist before destroying or disposing of their records
- transfer records of archival and historical importance to the National Archives.

Through its Records Disposition Program, the National Archives of Canada coordinates these two activities with all government institutions that come under the *National Archives of Canada Act* (1987). Information and records management staff in each government institution should make sure that their institution's cartographic, architectural and engineering records are linked to specific programs, functions or activities, and that they are included in the institution's Records Disposition Submission to the National Archives. These submissions, firstly, target the records of specific programs, functions and activities which may be disposed of at the end of the records' life cycle if the records have no historical or archival value; secondly, the submissions identify those records which do have historical or archival value and must be transferred to the National Archives. In this way, regardless of the media on which it is recorded, all government information related by program, function or activity can be disposed of in an integrated manner.

When Can Cartographic, Architectural and Engineering Records Be Disposed of?

Once the retention period has expired and there is no longer any operational need to keep cartographic, architectural and engineering records, they can be disposed of according to an approved Records Disposition Authority. The Records Disposition Authority is a document signed by the National Archivist of Canada granting approval for an institution to destroy records, alienate records from the control of the Government of Canada, or transfer records of archival or historical importance to the care and control of the National Archivist of Canada. The records covered are usually those detailed in the Records Disposition Submission originally tendered by the institution to the National Archives.

The National Archives has also preauthorized the destruction of certain types of records which are common to all government institutions and has issued Generic Records Disposition Authorities to cover these records. The generic authorities are applicable to the following three categories of records:

- Multiple Copies

  Where a record has been duplicated, for example, when maps are published in multiple copies, it is not necessary to retain more than two identical copies in government collections. Additional copies of blueprints, vandykes and various other types of reproductions can be destroyed once their usefulness in the institution has expired. The exception to this rule occurs when annotations have been added to the copy, thereby making it a new record.

Because such duplicate published records could well be useful to other institutions in Canada and abroad (e.g., other archives, map libraries, schools), records and information staff could contact the National Archives to see if the records can be passed on to another establishment instead of being destroyed.

- Transitory Records

  When cartographic, architectural and engineering records are required only for a limited time to ensure the completion of a routine action or the preparation of a subsequent record, they are considered "transitory records" and the institution can dispose of them under a generic disposition authority issued by the National Archivist. Titled *Authority for the Destruction of Transitory Records*, it is available on the National Archives Web site at *www.archives.ca*.

- Electronic Imaging and Source Records

  When cartographic, architectural and engineering records have been scanned and then migrated into an electronic imaging system, the source records (or originals) may be destroyed unless they have an intrinsic value based on unusual physical characteristics or age. Source records may also be destroyed if the institution intends to rely on the electronic images as the official or corporate "business record." Records having intrinsic value may include original artwork or documents with corporate seals affixed. Source records may include maps or graphic work, etc. In these instances, the generic *Records Disposition Authority No. 96/023 issued to Government Institutions for Records Related to Electronic Imaging Systems* is applicable. It is available on the National Archives Web site at *www.archives.ca*.

At the date of this printing, the National Archives of Canada had not yet issued a generic disposition authority covering published or printed cartographic records. All mapping agencies send their maps and atlases, including copies of all additions and updates, to the National Archives at the time of publication.

Geomatics Canada, which prints the government's maps for all publishing institutions, also sends copies of those maps to the National Archives. The Archives receives these maps under bilateral agreements – many of which are longstanding – between the National Archives, the publishing institutions and the printer. Whenever the institution asks the Archives to issue a disposition authority for its corporate records on all media, it would be useful to review these agreements in light of the Planned Disposition of Government Records Program.

In the case of unpublished cartographic records relating to published cartographic records, not all of the documentation is acquired by the National Archives. Generally, only a sample is required to illustrate the evolution of map production techniques. The selection is made when the records disposition submissions are prepared.

Other cartographic, architectural and engineering records of the Government of Canada are acquired by the National Archives through Records Disposition Authorities.

Need Advice?

If you have any questions regarding appropriate retention periods for your institution's cartographic, architectural and engineering records, or concerning the preservation and disposition of these records, you should first contact the information/records management staff in your institution. At the National Archives of Canada, staff specialized in the preservation of archival and historical cartographic, architectural and engineering records can also provide advice.

Additional assistance can be obtained by contacting the National Archives of Canada.

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Appendix A

Glossary of Terms

This glossary contains terms that relate to cartographic, architectural and engineering records and their management. The French equivalent is in parentheses.

acid or **acidic** (acide) Having a pH smaller than 7.

active records (documents actifs) Records which are maintained in proximity to operational areas because of frequent use.

alkaline (alcalin) Having a pH value greater than 7.

architectural record (document architectural) A pictorial representation of man-made structures intended to show how they will appear when completed.

archival record (document d'archives) *See* **record**.

atlas (atlas) A collection of maps designed to be kept (bound or loose) in a volume.

blueprint (bleu) A copy characterized by white lines on a blue background produced by a photographic process in which light is passed through a translucent document onto a paper treated with ferric salts.

brittleness (dessèchement) The decline in the humidity and suppleness of an object.

cartographic records (documents cartographiques) Records containing information depicting, in graphic or photogrammetric form, a portion of the linear surface of the Earth or of a heavenly body, such as maps, charts, plans and related materials including globes, atlases, topographic maps and hydrographic charts, other thematic map series, cartograms, block diagrams and aerial photographs.[13]

creator (créateur) *See* **provenance**.

dimensions (dimensions) The measurements of a record: height, followed by width and, if needed, followed by depth.

discolouration (décoloration) Changes to the colour of a record due to fading or darkening.

disposition (disposition) The final stage in the information life cycle when records are either (a) transferred to the National Archives for preservation; (b) transferred outside the Government of Canada; (c) destroyed.

dormant records (documents inactifs) Records which are used infrequently and can be stored off-site.

drawing (dessin) An original, scaled pictorial representation on paper or similar non-rigid support.

13 *Rules for Archival Description*, Chapter 5, Rule 5.0A1, Bureau of Canadian Archivists, Canadian Council of Archives, 1995-2000.

engineering records (documents techniques) Technical drawings such as cross-sections, details, diagrams, elevations, perspectives, plans, working plans, etc. of proposed or actual stationary structures that are not buildings (e.g., bridges, canals, dams) and of movable objects (e.g., equipment, machinery, ships, tools, vehicles, weapons, etc.).[14]

field mapping (lever, levé) The graphic representation of field observations made to determine the form and relative positions of phenomena.

flaking (effritement) Voids left in the surface of a work due to surface loss.

folder (chemise) A folded sheet of cardboard or heavy paper serving as a cover/container/enclosure for a set of related documents.

fonds (fonds) The whole of the documents, regardless of form or medium, automatically and organically created and/or accumulated and used by a particular individual, family or corporate body in the course of that creator's activities or functions.

geological map (carte géologique) A map that shows the structure of the Earth's crust.

globe (globe) A map of a celestial body or of the celestial sphere, depicted on the outside of a sphere.

hydrographic chart (carte hydrographique) A chart designed to assist navigation at sea or on other waterways.

hygrothermograph (hygrothermographe) An instrument used to measure and plot an ongoing record of changes in temperature and relative humidity (RH).

lux (lux) An international unit used to measure lumen, which is a measure of light as the human eye sees it. One lux equals one lumen per square meter or about one-tenth lumen per square foot. One footcandle equals approximately ten lux.

map (carte) *See* **cartographic record**.

map series (série de cartes, carte nationale) A group of maps or charts usually having the same scale and cartographic specifications, and with each sheet appropriately identified by the producing agency as belonging to the same series.

micro-organism (micro-organisme) An animal or vegetable organism too small to be seen except with a microscope.

mould (moisissure) A superficial, often woolly, growth produced on various forms of an organic matter especially when damp or decaying and on living organisms such as a fungus that produces moulds.

mylar (mylar) *See* **polyester film**.

ozalid (ozalid) A heat process used for reproducing documents.

planimetric map (carte planimétrique) A map representing only the horizontal positions of detail.

polyester film (mylar) (film de polyester, mylar) The thin, transparent plastic sheeting used as the support for many construction drawings due to its strength, flexibility and reproducibility. Sometimes known by the trade name Mylar.

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14 *Rules for Archival Description*, Chapter 6, Rule 6.0A1, Bureau of Canadian Archivists, Canadian Council of Archives, 1995-2000.

provenance (provenance) The person(s) or office(s) of origin of the fonds, i.e., the person(s), family (families) or corporate body (bodies) that created and/or accumulated and used records in the conduct of personal or business life.

record (document d'archives) A document made or received in the course of the conduct of affairs and preserved.

relative humidity (RH) (humidité relative) The ratio of the amount of water vapour in the air to the maximum possible at that temperature.

relief model (bloc-relief) A scale representation in three dimensions of a section of the surface of the Earth or other celestial body.

sling psychrometer (psychromètre) An instrument used to measure relative humidity.

soil map (carte pédologique) A map showing the physical and chemical qualities of the ground.

topographic map (carte topographique) A map whose principal purpose is to portray with contour lines and identify the features of the Earth's surface as faithfully as possible within the limitations imposed by scale.

ultraviolet light (UV) (lumière ultraviolette [UV]) The invisible light at the violet end of the light spectrum.

vandyke (vandyke) Invented by F. R. Van Dyke, a copying process that was used extensively for making architectural copies in the early twentieth century. Any sepia-toned print is sometimes known as a "vandyke".

yellowing (jaunissement) The yellowish or brownish discolouration of stored papers caused by light, air and warmth, especially in wood-pulp type papers.

Appendix B

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UNITED STATES OF AMERICA. National Archives and Records Administration. *Managing Cartographic and Architectural Records.* Instructional Guides Series. Washington, D.C., 1989.

Appendix C

Sources of Additional Information

National Archives of Canada

The National Archives of Canada offers a variety of services, courses, advice and information to government institutions on the management of their records. For general information, please direct your inquiries to:

Office of Government Records
Government Records Branch
National Archives of Canada
395 Wellington Street
Ottawa, Ontario K1A 0N3
Tel.: (613) 996-1557
Fax: (613) 947-1500
E-mail: *ogr@archives.ca*

For information and advice on all aspects of the management and preservation of cartographic, architectural and engineering records, contact:

Government Records Branch
National Archives of Canada
395 Wellington Street
Ottawa, Ontario K1A 0N3
Tel.: (613) 996-7619
Fax: (613) 995-6262

The Library and Documentation Services Division at the National Archives of Canada specializes in collecting information resources in the areas of archival science, conservation and information management. Subject access to these collections is facilitated by online databases. In addition, the Library holds monographs and periodicals which support the work of archival staff dealing with cartographic, architectural and engineering records. For more information contact:

Library and Documentation Services Division
National Archives of Canada
Room 256
344 Wellington Street
Ottawa, Ontario K1A 0N3
Tel.: (613) 992-6534
E-mail: *library@archives.ca*

Federal Records Centres (FRC) provide storage facilities for government records in most media. Contact your regional FRC for further information on its services.

Vancouver	(604) 666-8243
Edmonton	(403) 495-3120
Winnipeg	(204) 983-8845
Toronto	(416) 675-2546
Ottawa	(613) 954-4175
Montreal	(514) 283-4044
Quebec	(418) 878-2825
Halifax	(902) 426-5940

Professional Associations

The following professional associations provide advice and information on cartographic, architectural and engineering records:

Association of Canadian Map Libraries and Archives
c/o the National Archives of Canada
395 Wellington Street
Ottawa, Ontario K1A 0N3

Association of Canadian Archivists
P. O. Box 2596, Station D
Ottawa, Ontario K1P 1W6

Association des archivistes du Québec
Case postale 423
Sillery (Québec) G1T 2R8

Canadian Architecture Directory
777 Bay Street
Toronto, Ontario M5W 1A7

Royal Architectural Institute of Canada
55 Murray Street
Ottawa, Ontario K1N 5M3

Society for the Study of Architecture in Canada
Box 2302, Station D
Ottawa, Ontario K1P 5W5

Canadian Conservation Institute

Advice on the proper care, handling and storage of cartographic, architectural and engineering records, as well as other archival media, is also available from:

The Canadian Conservation Institute
Heritage Canada
1030 Innes Road
Ottawa, Ontario K1A 0C8
Tel.: (613) 998-3721
Fax: (613) 998-4721
E-mail: *cci-icc_services@pch.gc.ca*
Web site: *www.cci-icc.gc.ca*

Web Sites

The following Web sites can provide useful information related to the management of cartographic, architectural and engineering records. Each site also offers links to other national and international sites such as architectural archives, libraries, schools of architecture, museums, electronic discussion lists, electronic journals, etc. Information on publications available from the different institutions is included.

Although the Web addresses may change, useful and relevant sites can be found through a keyword search using terms such as architecture, architecture museums, architectural records, cartography, map libraries, map librarianship.

Archival and General Sites

Association of Canadian Archivists
www.archives.ca/aca

Canadian Archival Resources on the Internet
http://www.usask.ca/archives/menu.html

The purpose of this site is to provide a comprehensive list of links to Canadian archives and associated resources on the Internet. These include links to individual repositories, multi-repository databases, archival listservs, archival associations, educational opportunities and other related sites. Links are generally limited to archival repositories, but museums and library special collections departments have been included when they contain reference to non-published materials.

Canadian Council of Archives
www.cdncouncilarchives.ca

Canadian Herige Information Network (CHIN)
www.chin.gc.ca

Conservation OnLine (CoOL) – Resources for Conservation Professionals
www.palimpsest.stanford.edu

CoOL, a project of the Preservation Department of Stanford University Libraries, is a full text library of conservation information, covering a wide spectrum of topics of interest to those involved with the conservation of library, archives and museum materials.

National Archives and Records Administration, U.S.A.
www.nara.gov

This Web site contains links to various types of information including Professional Services (Records Management, Preservation, Archival Management, Internet Resources, etc.).

National Archives of Canada
www.archives.ca

Northeast Document Conservation Center
www.ncdcc.org

The Society of American Archivists
www.archivists.org

The Society of American Archivists serves the educational and informational needs of its members and provides leadership to ensure the identification, preservation and use of records of historical value. The Society is the publisher of a series of excellent books on archives.

Architectural Sites

Canadian Centre for Architecture
http://cca.qc.ca

Avery Architectural & Fine Arts Library, Columbia University, New York City, U.S.A.
www.columbia.edu/cu/libraries/indiv/avery

This Web page contains links to Collections and History, Guides, Resources etc., and provides a search engine. The Resources link includes "Internet compilations in Art, Architecture and Archaeology."

Cartographic Sites

Association of Canadian Map Libraries and Archives
www.ssci.uwo.ca/assoc/acml/acmla.html

Canadian Cartographic Association
www.geog.ubc.ca/~cca

Cartographic Resources on the Internet
http://atlas.gc.ca/english/carto/cartres.html

Canadian Map Libraries – General site
www.uottawa.ca/library/map/maplib.html

This site contains direct links to Canadian university map libraries and is available in both official languages.

International Cartographic Association
www.abdn.ac.uk/~geo350/index.html

Western Association of Map Libraries
www.waml.org

On this site, the Map Librarians Tool Box is particularly interesting.

Engineering Sites

Engineering Library, Columbia University, New York City, N.Y., U.S.A.
www.columbia.edu/cu/libraries/indiv/eng

Appendix D

List of Suppliers

Products for the preservation, storage, filing and display of cartographic, architectural and engineering records can be purchased from a number of Canadian sources. The following list of vendors is provided for information only and is not an endorsement of any product or merchant by the National Archives of Canada or the Government of Canada.

Capital Box of Ottawa Ltd.
1475 Star Top Road
Ottawa, Ontario K1B 3W5

Carr McLean Limited
461 Horner Avenue
Toronto, Ontario M8W 4X2

Groupe Lincora Inc.
6265 Notre-Dame Street East
Montreal, Quebec H1N 2E9
(for map cabinets in various sizes)
www.lincora.com/index.html

Induspac Ottawa, Inc.
3264 Hawthorne Road
Ottawa, Ontario K1G 3W9
(Branches in Calgary, Gloucester, Lachine, Thornhill, Toronto and Winnipeg)

Merkley Supply Ltd.
100 Bayview Road
Ottawa, Ontario K1Y 4L6
www.merkleysupply.com
info@merkleysupply.com

Smith Packaging Ltd.
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